

NON-PUBLIC?: N
ACCESSION #: 8811090362
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Millstone Nuclear Power Station Unit 3 PAGE: 1 of 3

DOCKET NUMBER: 05000423

TITLE: Reactor Trip Due to Low Low Steam Generator Due to Main Steam Isolation Valve Closure

EVENT DATE: 10/06/88 LER #: 88-023-00 REPORT DATE: 11/04/88

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION 50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Roger VanWey, Engineer, Ext 5050 TELEPHONE: 203-447-1791

COMPONENT FAILURE DESCRIPTION:

CAUSE: D SYSTEM: SB COMPONENT: ISV MANUFACTURER: S450
REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On October 6, 1988 at 1353 hours, with the plant at 100% power, the "C" Main Steam Isolation Valve (MSIV), 3MSS*CTV27C, closed during the performance of its partial stroke surveillance test. This resulted in a reactor trip due to low level in the "C" Steam Generator.

Root cause of the event was procedural inadequacy. The surveillance procedure did not adequately identify the requirement to jumper the voltage attenuators of the 2A and 2B solenoids. Bypassing the voltage attenuators allow full voltage to be applied to the solenoids which allow them to overcome the inherent drag forces within the solenoids.

The MSIV's successfully completed the partial stroke surveillance test after attenuator jumpers were placed on the 2A and 2B solenoids. Material changes to the solenoid valve piston rod, position indicator feeler and valve plug had been planned to minimize the drag effects within the solenoids by the next cold shutdown. The plant subsequently went to cold shutdown on October 24, 1988 and the material changes were made to the 1A, 1B, 2A, and 2B solenoids. The

applicable surveillance procedure has been changed to require bypassing of the voltage attenuator on the appropriate MSIV solenoids.

END OF ABSTRACT

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I. Description of Event

At 1353 hours on October 6, 1988, with the plant at 100% power, the "C" Main Steam Isolation Valve (MSIV), 3MSS*CTV27C, closed during performance of its partial stroke surveillance test. Immediately thereafter, a reactor trip on the resulting 'C" Steam Generator low low water level occurred. The subsequent Turbine and Generator trips were normal responses to the reactor trip. All safety, systems were fully operable at the time of the trip.

To perform a partial stroke test on a MSIV, the 2A and 2B solenoids associated with the MSIV are deenergized to allow, steam to be admitted to the top of the MSIV's main operating piston, while the vent paths, via solenoids 1A and 1B, are closed. This configuration pressurizes the top of the main operating piston to allow partial closure of the MSIV. After completion of the partial stroke, the 2A and 2B solenoids are reenergized (closed) to stop pressurization of the main operating piston and the 1A and 1B solenoids are reenergized (open) to vent the steam and depressurize the top of the piston. This allows the MSIV to fully open.

During performance of the partial stroke surveillance test on 3MSS*CTV27C, the valve stroked to the 90% OPEN position, opened as intended, then immediately went to the fully CLOSED position. Closure of 3MSS*CTV27C resulted in a low low steam generator water level and subsequent reactor trip.

After the trip occurred, operators immediately verified that the Reactor Trip and Bypass breakers had opened, that all control rods were fully inserted and that neutron flux was decreasing.

An Auxiliary, Feedwater actuation occurred as a result of the steam generator low low level signal. A Feedwater Isolation signal was received due to low Average Reactor Coolant System temperature after the trip. These are normal plant responses. No additional Engineered Safety Features Actuations were required or initiated. The plant was stable in Mode 3 (Hot Standby) at 1357 as indicated by Average Reactor Coolant System Temperature returning to a stable value.

II Cause of Event

Root cause of this event has been determined to be procedural inadequacy, in that the procedure did not identify all of the jumpers necessary to ensure that full voltage was applied to the normally energized MSIV solenoids during the partial stroke surveillance. The application of jumpers had been incorporated into the surveillance procedure to overcome the inherent drag forces within the solenoids.

Personnel performing the surveillance on 3MSS *CTV727C followed the procedure as written. The procedure stated to install jumpers on all voltage attenuators but listed only the 1A and 1B solenoids which vent the top of the main operating piston of 3MSS *CTV27C. The procedure did not identify the 2A and 2B solenoids which pressurize the top of the main operating piston to allow closure of 3MSS*CTV27C. In the test configuration, electrical jumpers are used to compensate for known drag effects on the solenoids' pistons by bypassing the voltage attenuators to allow uninterrupted full voltage to be supplied to the solenoids. During normal operation, jumpers are not required to be installed on the voltage attenuators because the solenoids deenergize to their OPEN position to close 3MSS*CTV27C.

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III. Analysis of Event

This event is reported in accordance with 10CFR50.73(a)(2)(iv), any event or condition that results in manual or automatic actuation of an Engineered Safety Feature. Immediate notifications were performed in accordance with 10CFR50.72(b)(2)(ii).

This event had not safety significance due to the fact that closure of 3MSS*CTV27C was an event consistent with the design basis of the plant. Safety system response was in accordance with intended design. The observed drag on the position indicating feeler and lack of jumpers on the 2A and 2B solenoids for 3MSS*CTV27C, did not have any adverse safety consequences since they did not prevent 3MSS*CTN"27C from closing (i.e., going to its safe position).

IV. Corrective Action

As immediate corrective action, jumpers were installed on solenoids 2A and 2B and the partial stroke surveillance procedure for 3MSS*CTV27C was satisfactorily completed. The Main Steam Isolation valves Partial Stroke Surveillance procedure was changes to require the installation of jumpers on the 2A and 2B solenoids.

Additional planned corrective actions to replace the internals of the MSIV

solenoids, to minimize drag effects, had been scheduled for the next cold shutdown. The plant subsequently went to cold shutdown on October 24, 1988 and the recommended changes were made to the 1A, 1B, 2A, and 2B solenoids of the four Main Steam Isolation valves.

V. Additional Information

There have been no similar events with the same root cause or sequence of events. Licensee Event Report 87-027, "Reactor Trip Due to Loss of Vital Bus Caused by Personnel Error", noted in its discussion that the "A" MSIV, 3MSS*CTV27A, failed to stroke while tested after a reactor trip. It was found that its 2B solenoid failed due to rubbing caused by run-out of the valve piston rod and a small air gap causing an increased magnetic coupling between the solenoid plunger and armature. Maintenance was performed on the 2B solenoid and operability was verified. The reactor trip was not related to problems associated with the MSIV.

EIIS CODES

Systems Component

Main Steam System - SB Isolation Valve - ISV

Solenoid - SOL

The MSIVs are model DAS 630 B Main Steam, Isolating Valves, manufactured by Sulzer Brothers Limited.

ATTACHMENT # 1 TO ANO # 8811090362 PAGE 1 OF 1

NORTHEAST UTILITIES

The Connecticut Light And Power Company

Western Massachusetts Electric Company

Holyoke Water Power Company

Northeast Utilities Service Company

Northeast Nuclear Energy Company

General Offices - Selden Street, Berlin Connecticut

P.O. BOX 270

HARTFORD, CONNECTICUT 06414-0270 (203)665-5000

November 4, 1988

MP-12418

Re: 10CFR50.73(a)(2)(iv)

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Reference: Facility, Operating License No. NPF-49
Docket No. 50-423
Licensee Event Report 88-023-00

Gentlemen:

This letter forwards Licensee Event Report 88-023-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(iv), any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Stephen E. Scace
Station Superintendent
Millstone Nuclear Power Station

SES/RAV:mo

Attachment: LER 88-023-00

cc: W. T. Russell, Region I Administrator
D. H. Jaffe, NRC Project Manager, Millstone Unit Nos. 2 and 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2 and 3

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